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AUTHOR Crespo, Hilda; Martinez-Perez, Luis A.
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ABSTRACT

Informal science programs play an important role in reinforcing the fact that science and mathematics are not difficult to master. This report is based on a survey of informal science programs supported by the National Science Foundation and exemplary programs in science and mathematics supported by the U.S. Department of Education. The survey consisted of three sections dealing with the population served, the curriculum and/or materials produced by the programs, and a range of open-ended questions regarding minority recruitment, mentoring, collaboration, and evaluation. Findings indicate that the number of persons served per program varied widely from as little as 10 per year to as many as 3.5 million per year. The distribution of students served according to school level revealed that the programs served a larger number of Middle/Junior High students followed by Elementary and Senior High students in about equal numbers. Findings from section 2 indicate that materials are produced for teachers, students, and to a lesser extent for parents, with the format of choice being the printed page. Findings from section 3 indicate that recruitment strategies for minority students vary widely; less than half of the respondents indicated that mentoring is an integral part of the program, and collaboration was one of the strongest points of these projects. The report also contains item-by-item responses, a list of programs responding to the survey, and all open-ended responses. (JRH)

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INFORMAL SCIENCE EDUCATION SURVEY

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Developed by: Hilda Crespo, Project Director
Dr. Luis A. Martinez-Pérez, Consultant

January, 1995

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INFORMAL SCIENCE EDUCATION SURVEY

Developed by:

Hilda Crespo, Project Director
and
Dr. Luis A. Martínez-Pérez, Consultant

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Introduction

Informal science programs play an important role in reinforcing the fact that science and mathematics are not difficult to master. Youth organizations, museums, and other community-based groups are essential in providing informal science education for middle school youth. Their role in cultivating the skills and talents of youth is well recognized. Latino community-based organizations are uniquely capable of reaching youth that are often difficult to reach by non-Latino organizations. The importance of out-of-school informal science experiences for young people to reinforce their interest in science and mathematics is of paramount interest to ASPIRA.

ASPIRA has developed a set of recommendations for community-based informal science programs directed toward Latino youth. The recommendations are based, in part, on the results of a survey of informal science programs supported by the National Science Foundation and exemplary programs in science and mathematics supported by the U.S. Office of Education. The results of the survey should provide useful information to community-based organizations, educators and other youth serving institutions interested in promoting greater Latino participation in math and science.

Objective

The primary objective of the project is to survey Informal Science Education programs and their impact on Latino youth and parents. The project explores a set of recommendations for community-based informal science programs based on the results of the survey.

Methodology

A survey of informal science and mathematics projects was conducted during the Spring of 1994. There were two separate mailings; one to recipients of NSF Informal Science Education grants as listed in their annual report and another to U.S. Department of Education Exemplary Programs as listed in a recent publication: Mathematics, Science and Technology Programs that Work. A follow-up letter was sent to all survey recipients requesting that it be completed in the event they had not done so. Survey results and analysis will be provided in this report. A copy of the survey instrument and the summary of the results is included in Appendix A.

Overview of Findings

A total of one hundred-fifty (150) institutions were contacted to participate in the survey. There were forty-eight (48) respondents to the two mailings of the survey. Below is an overview of the findings for each of the three sections of the survey. Additional information will be provided in a subsequent section where the results are given item-by-item. A list of programs responding to the survey and all free responses appear in Appendix A.

Section 1. The number of persons served per program varied widely. Programs served as little as 10 persons per year and as many as 3.5 million persons per year. The larger figures corresponds to science museums with a large attendance record. Both students and non-students were served by the programs. Of those programs serving both constituencies, the percentage of students served was 91.5%. The ethnic distribution of those served reflected the ratio of ethnicities in the general population. The distribution of students served according to school level revealed that the programs served a larger number of Middle/Junior High students followed by Elementary and Senior High students in about equal numbers. The cost of the programs also varied widely. The most expensive (cost per student) programs were those at the college level.

Section 2. Section two consisted of questions dealing with the curriculum and or materials produced by the programs. The programs have produced materials for students, teachers and parents in an approximate ratio of 4:4:1. Although the printed page was the most used medium, programs are taking advantages of modern technology via the use of computers, video/audio tapes and interactive video disks. English was the language used most followed by Spanish and an assortment of foreign languages. Only eight (8) of the persons responding indicated that the materials were specifically designed for bilingual students and nine (9) indicated that the materials addressed Hispanic cultural heritage and values. About half of the respondents indicated that the program was "very sensitive" to minority issues. Thirty-seven (37) of all respondents indicated that they served the entire United States. Others served various regions of the U.S., Puerto Rico and several countries abroad. The focus of the disciplines was distributed over several sciences and mathematics. The largest numbers were in General Science and Biology followed by Environmental Sciences, Earth Sciences and Mathematics with smaller numbers for other sciences. The majority of the programs served students during school hours. These materials were used in a variety of ways ranging from individual use to peer teaching. The most used curriculum methodology was that of "hands-on activities" with lesser numbers for calculators and computers. When asked a question on issues integral to the materials, the majority indicated equity/gender and self-esteem and pride as those considered most. The answers to the question on standards used in the preparation of the curriculum revealed that several were used but the largest number of respondents indicated no/answer.

Section 3. Section three contained a series of questions requiring free responses. The specific answers are included in the following section.

Analysis of the Survey of Informal Science and Mathematics Projects

The survey consisted of twenty-one (21) forced response items and thirteen (13) open response items (see Appendix B). Average values for the forced response items appear in bold print following each item. A listing of the open responses and their frequencies (also in bold print), follow each free response item. Whenever appropriate, a discussion of the responses and/or a graph is also included after each item. The discussion portions appear in *italics*.

Number of Survey Forms Distributed: **(150)**
Number of Forms Returned: **(48)**
Response Rate: **(34%)**

Section I. Target Population (Recruitment)

1. Total number of persons served per year: **(1,341,415)**

The responses to this item varied widely. The range of the responses is from a low of 10 to a high of 3.5 million persons served. The median was 6,250 persons served.

2. Are all persons served students?

YES **(17)** NO **(31)**

3. If the answer to #2 is NO, what percentage of the total are students? **(91.5 %)**

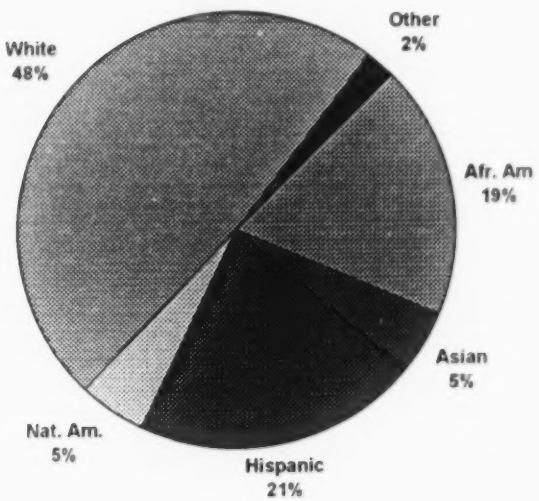
The median value for this question was 97%.

4. What is the percentage distribution of persons served according to ethnicity?

a. African-Americans **(19.1 %)**
b. Asian **(4.9 %)**
c. Hispanic **(21.1 %)**
d. Native Americans **(5.0 %)**
e. White **(48 %)**
f. Other Minorities **(2 %)**

Minorities which are underrepresented in traditional science/math programs (not informal science) are represented here in percentages which mirror their numbers in the total population.

Fig. 1: Percentage distribution of persons served according to ethnicity

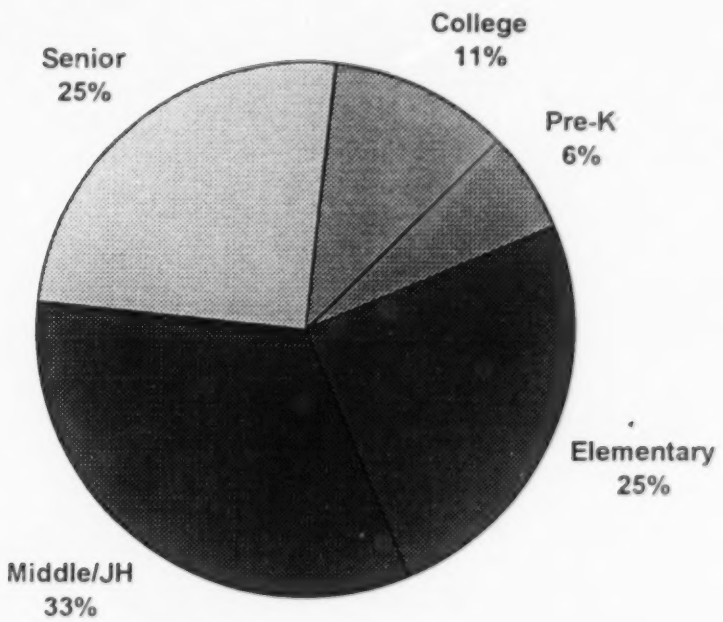


5. What is the percentage distribution of students served according to school level?

a. Pre-K **(6.2 %)**
b. Elementary **(25.4 %)**
c. Middle/Junior High **(33.5 %)**
d. Senior High **(25.5%)**
e. College/University **(10.8 %)**

The largest number of students served is at the middle/junior high level. This follows the national trend, where the efforts are concentrated at this level. The figure for the elementary level is an encouraging one since the amount of science taught at many elementary schools is small.

Fig. 2: Percentage distribution of students served according to school level



6. What is the approximate cost per student served? **($ 514.90)**

The range of the responses goes from a low of $.00 to a high of $7,500.00 per year. The median for these responses is $5.00.

Summary:

The results for Section I reveal the following about the informal science/math education programs surveyed:

- There is a wide variety of programs serving anywhere from very small to very large populations.
- The majority of those served by these programs are students (91.5 %).
- The number of persons served closely resembles the general population. Minorities appear to be served by informal science/math education programs in percentages which resemble the general population. This is not the case for traditional programs.
- Middle/Junior High students are the most served by these programs. This happens to be the target population for the ASPIRA Science/ Math program.
- The cost per students varies greatly. The most expensive programs are those supporting students in graduate programs.

Section 2: Curriculum/Materials Produced

1. The program has produced curriculum materials for:

   a. Teachers **(38)** b. Students **(37)** c. Parents **(10)**

2. Curriculum materials have been produced in the following format:

   a. Printed **(39)**
   b. Video/audio tape **(19)**
   c. Computer **(13)**
   d. Interactive videodisc **(3)**
   e. Other (specify) **(6)**

3. Language(s) of materials:

a. English **(44)** b. Spanish **(15)** c. Other (specify) **(8)**

Listed: **Braille**
Japanese
Russian
Slovakian
Hawaiian
German
Dutch
Portuguese

4. Are materials specifically designed for bilingual students?

a. Yes **(7)** b. No **(35)**

Although fifteen (15) respondents to the previous question indicated that the language of the materials was Spanish, as many as thirty-five respondents to question #4 indicated that materials were not specifically designed for bilingual students. This may indicate that the term "bilingual" may be used to label a student who uses exclusively a language other than English.

The following programs indicated that the materials are specifically designed for bilingual students:

Kite Project
Fishbanks Ltd.
The Mechanical Universe High School Adaptation
Exemplary Center for Reading Instruction (ECRI)
Kindermath (Matemäticas para Niños)
ASPIRA Mathematics and Science Program

5. Do the materials address Hispanic cultural heritage and values?

a. Yes **(9)** b. No **(33)**

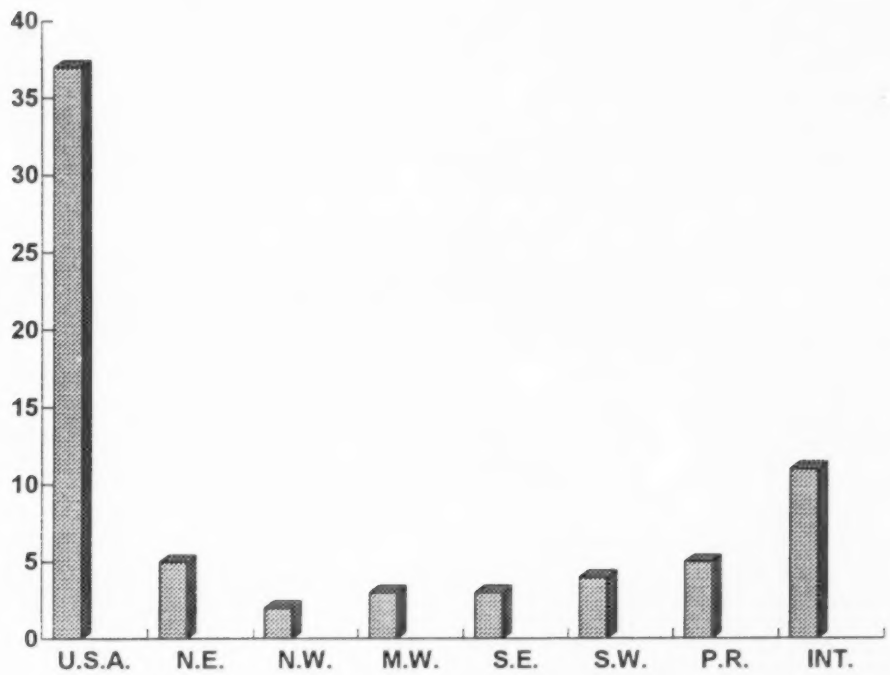
6. Sensitivity to minority issues:

a. Very sensitive **(21)**
b. Somewhat sensitive **(12)**
c. Was not considered **(12)**

7. Geographic region(s) targeted:

a. U.S.A. **(37)**
b. Northeast **(5)**
c. Northwest **(2)**
d. Midwest **(3)**
e. Southeast **(3)**
f. Southwest **(4)**
g. Puerto Rico **(5)**
h. International (specify) **(11)**
Listed: Saudi-Arabia
Europe
Canada
Mexico
Japan

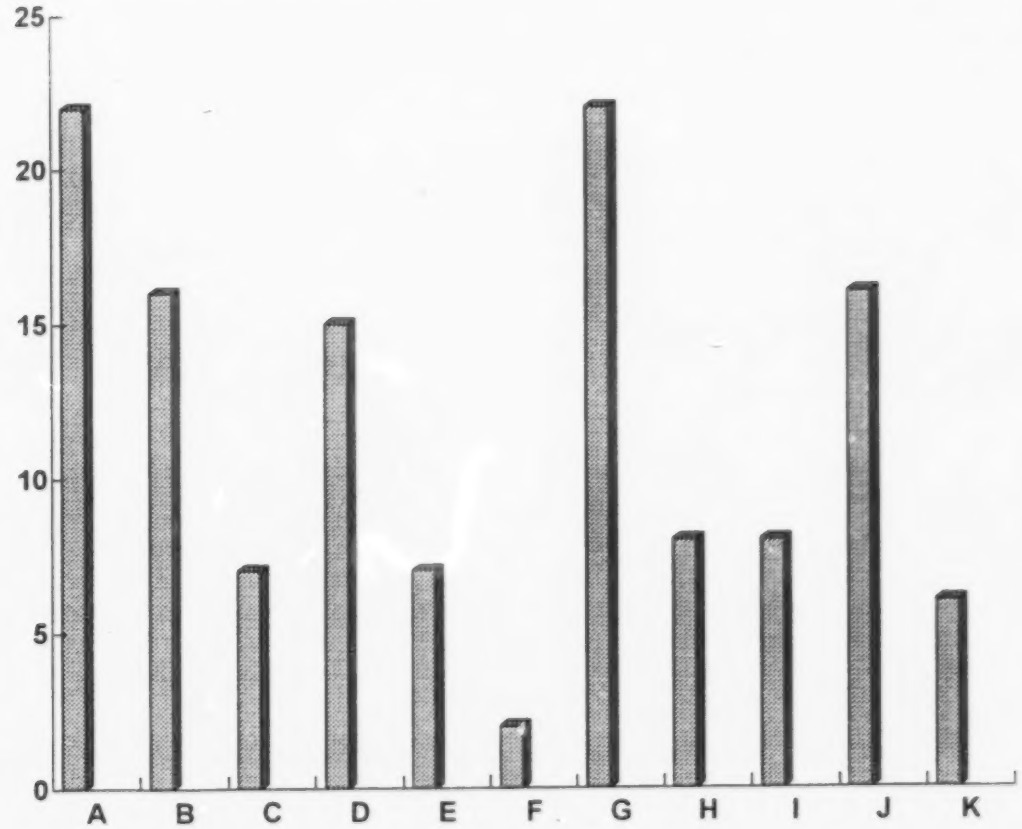
Fig. 3: Geographic regions targeted



8. What is the discipline focus?

a. General Science **(22)**
b. Environmental Science **(16)**
c. Health **(7)**
d. Earth Sciences **(15)**
e. Space Science **(7)**
f. Biomedical Sciences **(2)**
g. Biology **(22)**
h. Chemistry **(8)**
i. Physics **(8)**
j. Mathematics **(16)**
k. Other (specify) **(6)**
Listed: Integrated Arts
Math/Science
Engineering
Reading
Computers
Language

Fig. 4: Distribution of discipline foci

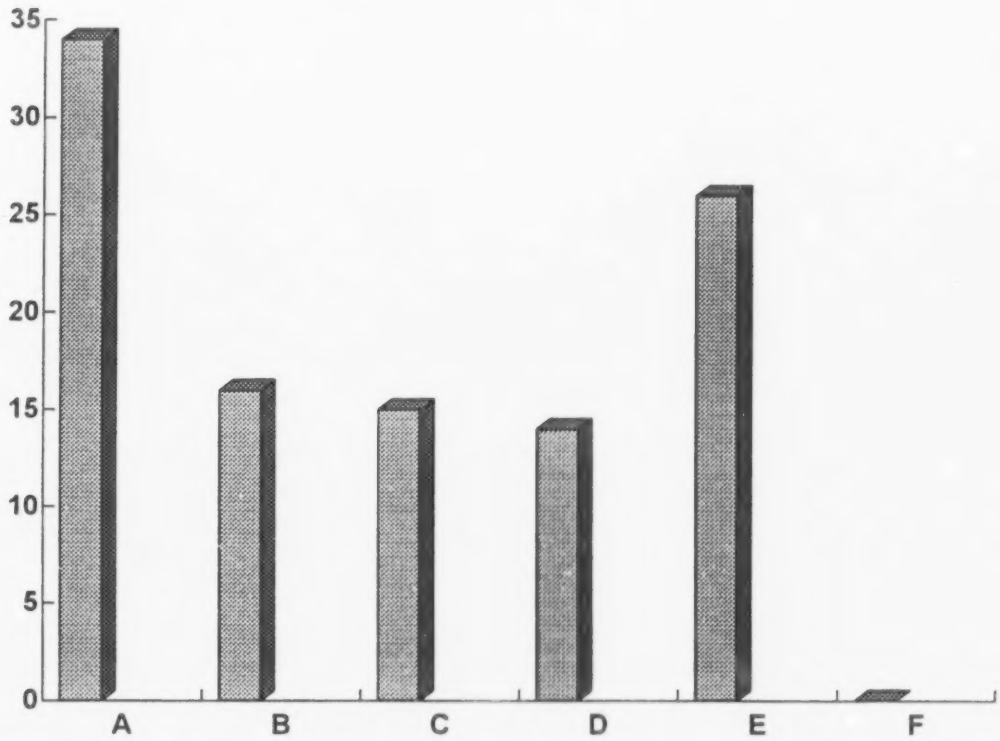


9. The strategies developed by the project are mainly for use at/in/on:

a. School (regular hours) **(34)**
b. After school programs **(16)**
c. Home **(15)**
d. Week-ends **(14)**
e. Summers **(26)**
f. Other (specify) **(0)**

The number of after-school programs seems small considering that many of the projects responding to the survey view themselves as informal science programs. The number should increase as community-based organizations become more involved in informal science and mathematics programs. The large number of programs serving students during school hours is due to the fact that it is much easier to capture the students during this time.

Fig. 5: Designated use of strategies

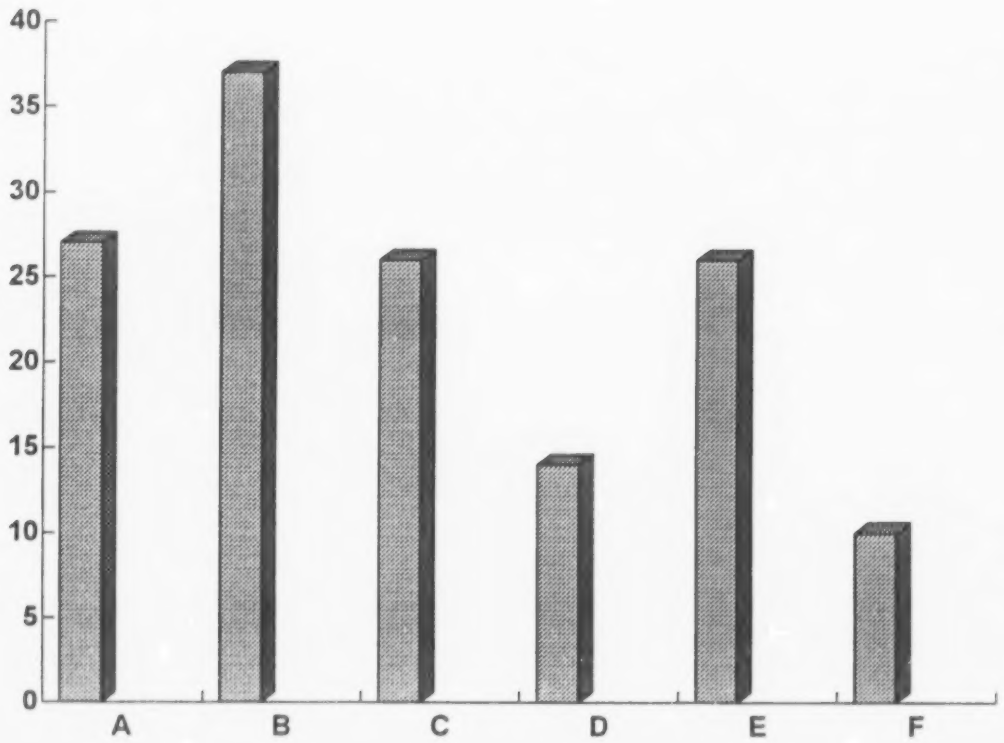


10. Materials have been designed specifically for:

a. Individual use **(27)**
b. Group use **(37)**
c. Academic year use **(26)**
d. Summer sessions use **(14)**
e. Cooperative learning groups use **(26)**
f. Peer teaching **(10)**

There seems to be a reasonable distribution of responses for this question. Projects are including individual use and cooperative learning strategies besides the traditional group use.

Fig. 6: Designated use of materials

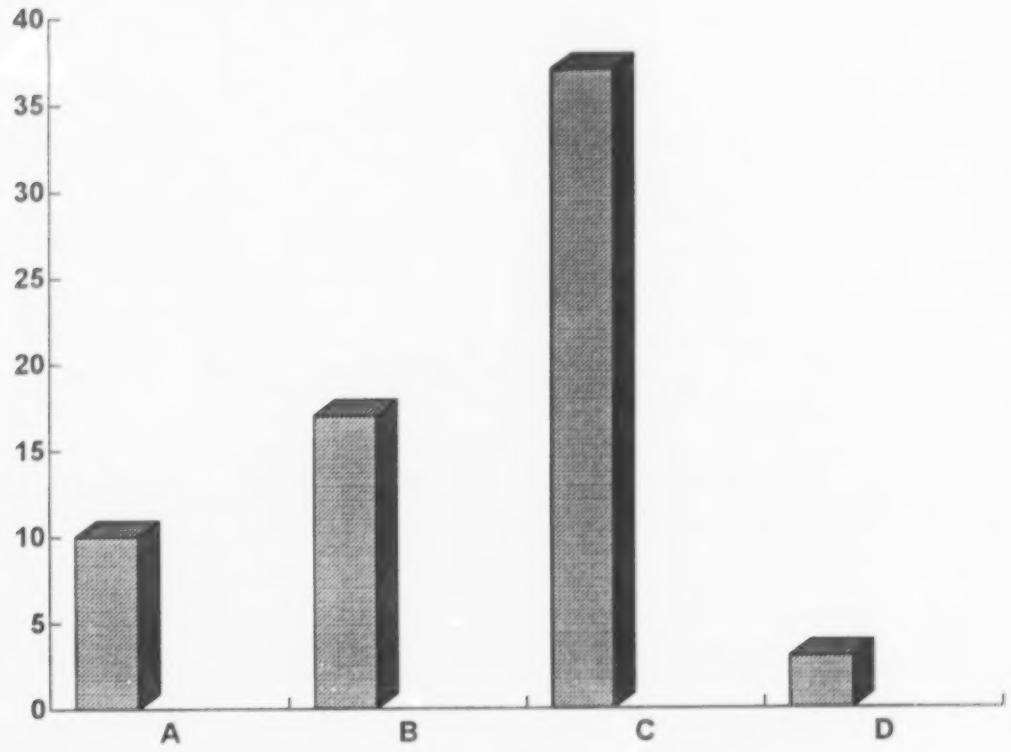


11. Curriculum methodology includes the use of:

a. Calculators **(10)**
b. Computers **(17)**
c. Hands-on activities **(37)**
d. Other (specify) **(3)**

The fact that 37 respondents indicated that they include the use of hands-on activities is very encouraging. This may indicate the use of manipulative materials as well as pencil-paper activities.

Fig. 7: Use of technology and hands-on activities in curriculum

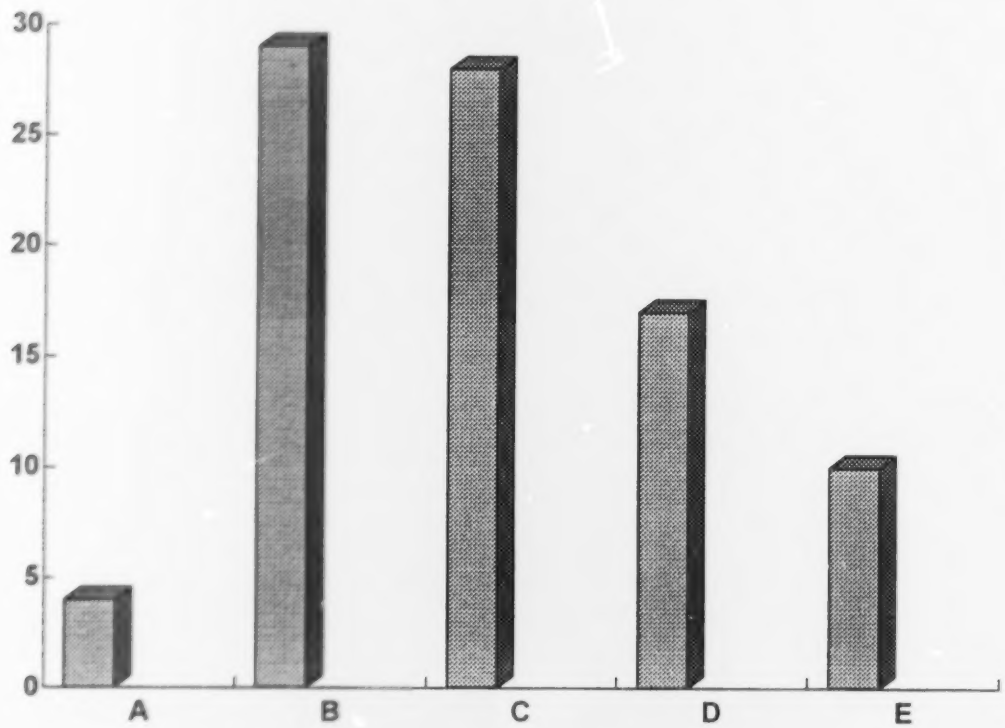


12. The following issues are an integral part of the materials produced:

a. Contributions of Hispanics **(4)**
b. Equity/Gender **(29)**
c. Self esteem and pride **(28)**
d. Diversity **(17)**
e. Others (specify) **(10)**

The number of respondents indicating that the contribution of Hispanics are an integral part of the materials produced is very small. This may indicate that more materials need to be available to projects and/or training is needed for materials developers on the contributions of Hispanics.

Fig. 8: Issues integral to the curriculum

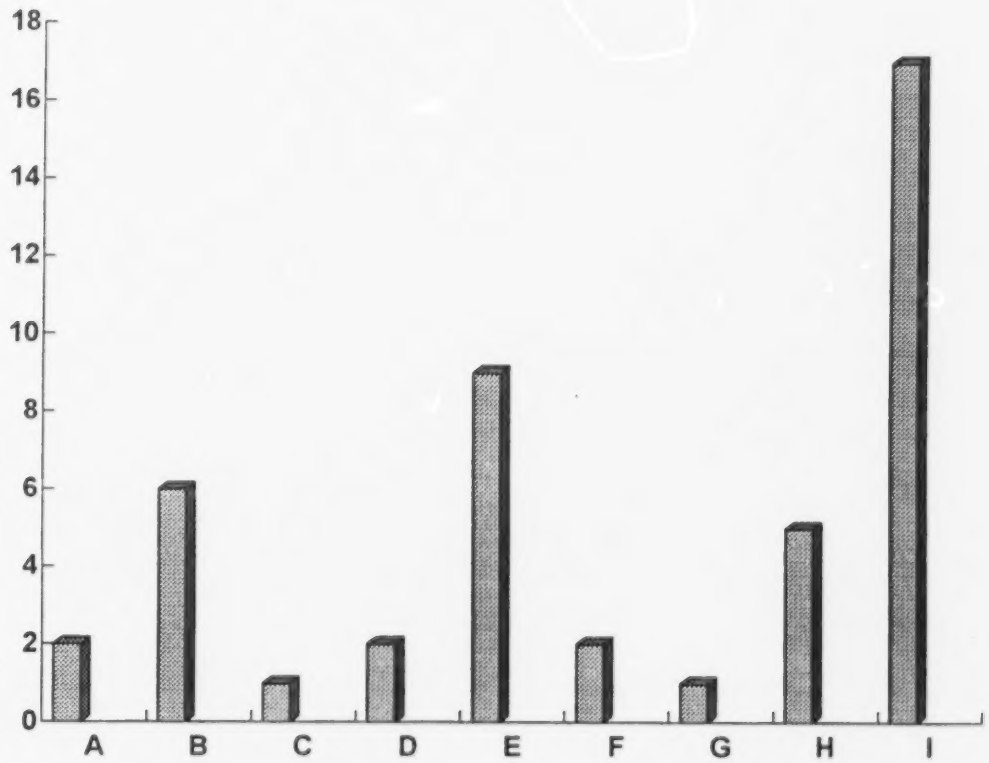


13. Please list the source(s) of standards you have considered in the preparation of the project's curriculum materials.

a. District Standards **(2)**
b. State Standards **(6)**
c. National Standards **(1)**
d. NSTA Standards **(2)**
e. NCTM Standards **(9)**
f. Textbooks **(2)**
g. Legislation **(1)**
h. Other **(5)**
i. Not Applicable/No answer **(17)**

The number of projects considering standards are very low. The reasons for these responses are many. Among these are: lack of knowledge of the standards, lack of training in the use of the standards, and resistance to change.

Fig. 9: Standards considered in the preparation of curriculum materials



Summary:

The results for Section II reveal the following about the informal science/math education programs surveyed:

- The number of programs producing materials for parents is small when compared to those producing materials for teachers and/or students.
- More programs need to integrate technology to the production of curriculum materials.
- Approximately one-third of the respondents indicated that Spanish was a language used in the production of materials. A much smaller number (about one-sixth) indicated that materials were specifically designed for bilingual students.
- Very few of the respondents (about one-third) indicated that materials produced addressed Hispanic cultural heritage and values. This may indicate that only materials which are intended for bilingual programs take this into consideration.
- Most respondents indicated that they consider the United States as the targeted geographic area.
- Materials are distributed throughout the disciplines with the largest numbers corresponding to General Science and Biology.
- The majority of the programs serve students during school hours. It is easier to capture the students during these times since many students work after school and on Saturdays.
- Various instructional grouping strategies are being considered in the design of materials. Among these are cooperative learning and individual use.
- A large number of the respondents indicated that their curriculum methodology includes the use of hands-on activities.
- The number of programs considering any type of standards is very low.

Section 3. Other:

1. Recruitment strategies for minority students

Through community organizations (3)
Newspapers (1)
Application Process/Interviews (1)
Brochures (2)
Presentations at schools (4)
Word of mouth (2)
Outreach coordinator (2)
Through school personnel (6)
Media presentations (1)
Not Applicable/No Answer (21)

The large number above (21) may indicate that students are served during school hours and therefore no recruitment strategy is used.

2. How are parents recruited/involved?

Through community organizations (4)
Through direct contact with museum personnel (1)
Mailings (2)
Representation in advisory committees (1)
Written agreements from parents (1)
Special program targeted for parents (4)
Through design of activities for parents and children together (2)
Through orientation sessions (3)
Through materials sent home with students (3)
Parents used as leaders, facilitators (2)
Not Applicable/No answer (27)

The large number (27) is reasonable since the number of programs serving parents is very small.

3. How are teachers recruited/involved?

Through community organizations (4)
Teacher workshops, training sessions, inservice (unpaid) (13)
Same as b, but paid (1)
Publications for teachers (2)
Used as reviewers of materials (1)
Through membership in advisory committees (2)
Direct mail (5)
Through professional societies (4)
Used as instructors (2)
Program leads to pre-service and teaching positions (2)
Open house activities for teachers (1)
Not Applicable/No Answer (13)

4. Are mentorship activities an integral part of the project?

a. Yes **(18)** b. No **(28)**

5. What are the sources of mentors?

Through community organizations (4)
Older, more experienced students (7)
Program staff (5)
Area scientists (2)
Senior interns (1)
Not Applicable (27)

6. How are mentors recruited?

Recommendations of museum youth staff (1)
Through staff meetings (1)
Through interpreters (1)
Word of mouth (6)
Professional organizations (1)
Through local universities (1)
Through hospitals (1)
Not Applicable/No answer (37)

7. What are the roles of mentors in the project?

Training with specific materials (9)
Role models (4)
Guides (2)
Advisors (2)
Partners (1)
As resources for interpreters (1)
As sources of internships and research (2)
As resources for science fairs (3)
Offer encouragement (1)
Not Applicable/No Answer (27)

Answers to questions 5-7 reveal that a large number of projects do not include the use of mentors in their programs.

8. Are there financial supporters for the project (other than NSF)?

a. Yes **(35)** b. No **(7)**

Programs appear to have multiple sources of funding. This is not uncommon due to the size of awards made.

9. If YES, please specify

User fees (2)
Local universities (4)
Industrial/Commercial sector (1)
State or national agencies (22)
Foundations (8)
Eisenhower funds (1)
Individuals (1)

10. How are project materials related to the existing school curriculum?

Tied to standards (4)
Through classroom kits (1)
Through teachers' manuals (1)
Through specific applications by teachers (12)
It's in the school curriculum (2)
Teachers are consulted as curriculum is developed (3)
Through state curriculum guidelines (6)
Tied to state frameworks (1)
Not Applicable/No Answer (15)

11. How is success measured? (i.e., how are outcomes measured?)

Skills tests (13)
Surveys (7)
Amount of teacher demand (1)
Media attention (1)
Donations (2)
Pre- and post-tests (12)
Focus groups (1)
Follow-up letters (2)
Attendance (2)
Summative evaluation (6)
Teacher evaluation sheets (2)
External evaluator (1)
Parent evaluation sheets (1)
Self-evaluation (2)
Post-activity correspondence with mentors (1)
Frequency of presentations (2)
Not Applicable/No Answer (4)

12. What are the follow-up strategies used by the project?

Written project material (2)
Newsletter (7)
Teaching workshops (6)
Review for possible programmatic changes (5)
Students become paid volunteers (1)
Parents follow-up packets (5)
Telephone surveys (12)
Not Applicable/No Answer (18)

The large number (18) may indicate that many of the programs may end once the funding ends or that a follow-up plan was not included when the program was proposed.

13. The project collaborates with:

Public schools (41)
Colleges/Universities (28)
International Governments (1)
Community-based organizations (24)
Museums (13)
Private schools (29)
Professional organizations (23)
Libraries (1)
Government agencies (20)
Environmental agencies (1)
Local government (2)
Churches (6)
Not Applicable/No Response (4)

14. Does the project Advisory Committee include Hispanics?

a. Yes **(14)** b. No **(8)** c. No Advisory Committee **(25)**

The fact that twenty-five (25) respondents indicated that they have no advisory committee is rather disturbing. Most funding sources require than an advisory committee be formed and that their advise considered. The fact that only eight programs include Hispanics is small when one considers that 21% of those served by the programs are Hispanics.

15. Please list below any other science/mathematics projects you have knowledge of (not NSF funded) serving underrepresented populations.

MISIP (U.S. Dept of Ed.) (1)
Headstart Program (1)
Carnegie-Mellon Role Models Program (1)
ACE, CEAAM, CMTC (1)
Science Enrichment for Underserved Students (1)
Locally funded programs (3)
Other (6)
Not Applicable/No Response (33)

Summary of Results

Section 1. Target Population

The total number of persons served per year varies considerably from program to program. Programs which have direct contact with students have smaller numbers while producers of curriculum and other materials will claim serving larger numbers. Both students and non-students are served. Non-students are mainly parents and teachers. The ethnic distribution of persons served is not far from the national ethnic distribution. The largest number of students served is at the middle/junior high school level. The cost of the program varies widely. College programs are the most expensive since they may include student support. The latter are also more intensive and they use college faculty and facilities.

Section 2. Curriculum/Materials Produced

Materials are produced for teachers, students and, in a small degree, for parents. The format of choice continues to be the printed page. The use of technology is evident in the responses, but to a lesser degree. The high cost may be one of the reasons. The majority of the projects use english as the language medium (44/48) while Spanish is used less (15/48). Materials are also produced in a variety of languages other than English and Spanish. A very small number of projects prepare materials specifically for bilingual students. It is possible that the term "bilingual" is not defined by all respondents in the same way. This may indicate that the term "bilingual" may be used to label a student who uses exclusively a language other than English. A very small number (9/48) indicated that the materials address Hispanic culture heritage and values. It is possible that the projects do not have the necessary information to include in the materials. Appropriate training may be necessary. The needed information is available from a variety of sources, including many federally funded projects and science/mathematics organizations such as NSTA, NCTM, and AAAS. Less than half of the respondents indicated that they are "very sensitive" to minority issues.

The programs are distributed throughout the United States and many seem to serve national needs. The discipline focus of the materials is divided among the traditional science disciplines and mathematics. The majority of the materials target Biology, General Science and earth Science. The number of projects which serve students after school hours is considerably smaller than the regular school hours projects. The increase of involvement on the part of community-based organizations should increase the number of programs serving this need. Materials have not only been designed for group use, but also less traditional uses such as individual use and cooperative learning groups use. A large number of programs (37/48) indicated that they include hands-on activities in their methodology. Calculators and computers are also included. A dismal number (8/48) indicated that the contributions of Hispanics is an integral part of the materials produced. Appropriate training and/or the securing of suitable materials may be needed to alleviate this problem. Few projects seem to include standards in the preparation of materials. Lack of knowledge of these standards may be the reason. Contacting the source of the standards is usually the best solution.

Section 3. Other

Recruitment strategies for minority students vary. A large number of programs (21/48) gave no response. It is possible that many of these do not have direct student contact. The same holds true for the recruitment of parents. Teachers are also recruited from a variety of sources. The answers to all three questions above suggest that projects should diversify their recruitment strategies to increase the number of persons involved.

Less than half of the respondents (18) indicated that mentoring is an integral part of the programs. Programs should explore sources, recruitment strategies and roles of mentors in order to increase their involvement. Several of the projects (35/42) indicated that they have funding other than from NSF. State or national agencies was mentioned the most as an alternate source of funding. Teachers seem to be responsible for relating the materials to existing curricula. There are a variety of ways through which the projects evaluate their efforts. Follow-up strategies are also varied although a large number of respondents (18/48) gave no response on follow-up strategies. Collaboration seems to be one of the strongest points of these projects. Many of the programs have multiple examples of collaboration. A large number of the projects (25/48) indicated that they do not have an advisory committee and 8 indicated that they have Hispanics in their advisory committee. On the question of knowledge of projects serving underrepresented populations, the answer was disappointing. The number of projects indicating "Not Applicable/No Response" was 33 out of 48. This lack of knowledge may be due to poor dissemination efforts on the part of some projects and leads to duplication of efforts, among others.

Summary of Recommendations

The following list of recommendations are based on the results of the survey. Recommendations are intended for existing informal science programs, policy makers and funders.

Recruitment:

1. Community organizations and parents should be used an integral part of recruitment efforts for informal science education.

2. Community organizations should work in conjunction with schools to increase recruitment efforts.

3. Teachers should be included in service efforts with community organizations.

4. Teacher organizations should be involved in the efforts to recruit teachers for these programs.

5. Programs should increase the efforts to recruit mentors from minority populations.

6. Sources of mentors should be sought and roles of mentors clearly specified.

7. All project materials should be related to existing school curriculum. Materials should be keyed to the school curriculum and to national, state and local standards.

8. The membership of advisory committees should parallel the ethnic and socio-economic distribution of the intended student clientele.

Curriculum Materials:

1. Increase the amount of materials for students and parents where Spanish is used.

2. A considerable increase is needed in the production of materials specifically designed for bilingual students.

3. Materials intended for bilingual (Spanish-English) should address Hispanic cultural heritage and values.

4. Address the need for increasing materials, stressing the Biomedical Sciences, Chemistry and Physics in addition to efforts in other science and mathematics.

5. Increase the number of materials which are intended for use in after school programs, at home and on weekends.

6. Provide more materials which address the use of computers, interactive media and calculators.

7. Make sure that materials produced include, Hispanic role models and the contributions of Hispanics to the science, mathematics and technology areas.

8. Projects in these areas should all address national and/or state standards as an integral part of the development of curriculum materials.

Teacher Preparation:

1. Teacher preparation programs should include the education of minorities as an integral part of the programs. Included should be the teaching of language minority students, bilingual education, Hispanic cultural heritage and values and Hispanic role models.

2. Teacher inservice programs should also include the topics outlined in (1) above.

Linkages:

1. Programs should establish linkages with community-based organizations, colleges and universities, school systems, the private sector and other informal science and mathematics education programs.

APPENDIX A

NUMBER OF TABULATED RESPONSES = 48

AAAS Mass Media Science & English Fellows Program
AIDS Exhibits
Aquarist Summer
ASPIRA Math & Science Program (MAS)
Better than Gold: Plants & Animals
California Aquatic Science Ed.
Children's Science Books
CHILD (Computer Helping Instruction & Learning Development)
Cincinnati's Ice Age
Conservation for Children
Developmental Approaches in Science & Health
Exemplary Center for Reading Instruction (ECRI)
FAST (Foundational approaches in Science Teaching)
Fishbanks, Ltd
Hall of Life Health Science
High/Scope Institute for IDEAS
Human Language Series
Iowa Chautauqua Program
Keyboarding, Reading and Spelling
Kindermath (Mathematics para Ninos)
Kite Project
McQuesten Brook Wetland Study
Mission Science Workshop
Mission to Mars
Move it Math/Jeff Davis Feeder School
PFTW - Preparing for Tomorrow's World
Physics, Teach to Learn
Project SITE
Promoting Science Literacy
Rain Forest: Exploring Life on Earth (Exhibit Gallery)
RAMPS
Reptile Discovery Center
Saturday Science
Schreibe Hall of Birds
Sci-Math
Science Kits (Native Americans)
Science Career Ladder
Science-by-Mail
Sharing Science
Sound Foundations

RESPONSES
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Stand and Deliver - The Play
Success Understanding Mathematics (SUM)
Teacher Enhancement through Student Research Projects
The Secret of Life
The Mechanical Universe
Three-Two-One CONTACT Extended Use Project
Virginia 4-H Marine/Aquatic
Women in Natural Sciences

APPENDIX B

The ASPIRA Association, Inc.
1112 16th Street, NW Suite 340
Washington, D.C. 20036

SURVEY OF INFORMAL SCIENCE AND MATHEMATICS PROJECTS

Instructions: Please complete as many items as are applicable to your project. Feel free to add any comments. Use the back of the page if additional space is needed. Return the completed survey in the self-addressed envelope enclosed. Thank you for your cooperation. ***Please return on or before January 15, 1994.***

1. Project Title: _____

2. Current Project Director: _____

Section I. Target Population

1. Total number of persons served per year: _____

2. Are all persons served students? ____YES ____NO

3. If the answer to #2 is NO, what percentage of the total are students?

_____

4. What is the percentage distribution of persons served according to ethnicity?

a. African-Americans	_____	d. Native Americans	_____
b. Asian	_____	e. White	_____
c. Hispanic	_____	f. Other Minorities	_____

5. What is the percentage distribution of students served according to school level?

a. Pre-K	_____	d. Senior High	_____
b. Elementary	_____	e. College/University	_____
c. Middle/Junior High	_____		

6. What is the approximate cost per student served? _____

Section 2: Curriculum/Materials Produced
CHECK AS MANY CHOICES AS APPLICABLE

1. The program has produced curriculum materials for:

   a. Teachers_____ b. Students_____ c. Parents _____

2. Curriculum materials have been produced in the following format:

   a. Printed _____ d. Interactive videodisc _____
   b. Video/audio tape _____ e. Other (specify)_____
   c. Computer _____

3. Language(s) of materials:

   a. English _____ b. Spanish _____ c. Other (specify)_____

4. Are materials specifically designed for bilingual students?

   a. Yes _____ b. No _____

5. Do the materials address Hispanic cultural heritage and values?

   a. Yes _____ b. No _____

6. Sensitivity to minority issues:

   a. Very sensitive _____ c. Was not considered _____
   b. Somewhat sensitive_____

7. Geographic region(s) targeted:

   a. U.S.A. _____ e. Southeast _____
   b. Northeast _____ f. Southwest _____
   c. Northwest _____ g. Puerto Rico _____
   d. Midwest _____ h. International (specify) _____

8. What is the discipline focus?

   a. General Science _____ g. Biology _____
   b. Environmental Science _____ h. Chemistry _____
   c. Health _____ i. Physics _____
   d. Earth Sciences _____ j. Mathematics _____
   e. Space Science _____ k. Other (specify)
   f. Biomedical Sciences _____ _____

9. The strategies developed by the project are mainly for use at/in/on:

a. School (regular hours) _____
b. After school programs _____
c. Home _____
d. Week-ends _____
e. Summers _____
f. Other (specify) _____

10. Materials have been designed specifically for:

a. Individual use _____
b. Group use _____
c. Academic year use _____
d. Summer sessions use _____
e. Cooperative learning groups use _____
e. Peer teaching _____

11. Curriculum methodology includes the use of:

a. Calculators _____
b. Computers _____
c. Hands-on activities _____
d. Other (specify) _____

12. The following issues are an integral part of the materials produced:

a. Contributions of Hispanics _____
b. Equity/Gender _____
c. Self esteem and pride _____
d. Diversity _____
e. Others (specify)_____

13. Please list the source(s) of standards you have considered in the preparation of the project's curriculum materials.

_____
_____
_____

Section 3. Other:
PLEASE COMMENT AND/OR SELECT THE APPLICABLE RESPONSES

1. Recruitment strategies for minority students

_____
_____
_____

2. How are parents recruited/involved?

_____
_____
_____

3. How are teachers recruited/involved?

_____
_____
_____

4. Are mentorship activities an integral part of the project?

a. Yes _____ No. _____

(IF THE ANSWER IS NO, GO TO QUESTION 8)

5. What are the sources of mentors?

_____
_____
_____

6. How are mentors recruited?

_____
_____
_____

7. What are the roles of mentors in the project?

_____
_____
_____

8. Are there financial supporters for the project (other than NSF)?

a. Yes _____ b. No _____ If YES, please specify

_____
_____

10. How are project materials related to the existing school curriculum?

_____
_____
_____
_____
_____

11. How is success measured? (i.e., how are outcomes measured?)

_____
_____
_____
_____

12. What are the follow-up strategies used by the project?

_____
_____ _____
_____

13. The project collaborates with:

a. Public schools _____
b. Private schools _____
c. Colleges/Universities _____
d. Community-based organizations _____
e. Government agencies _____
f. Professional Organizations _____
g. Churches _____
h. Museums _____
i. Other (specify)
_____

14. Does the project Advisory Committee include Hispanics?

a. Yes _____ b. No _____ c. No Advisory Committee _____

15. Please list below any other science/mathematics projects you have knowledge of (not NSF funded) serving underrepresented populations.

_____
_____
_____

****

I would like to receive a copy of the results of this survey Yes _____ No. _____
IF YES, PLEASE SEND TO:

Name _____
Address _____
_____
_____
_____

****

Thank you for your response!

Related ASPIRA Publications:

The following ASPIRA publications were also examined in view of the survey of informal science education. These are based on ASPIRA's accumulated research efforts and will be reflected in our recommendations at the end of this report.

a. ASPIRA Mathematics and Science Academy Implementation Manual. The manual is being published as part of a project funded by The Carnegie Corporation of New York under grant #B5636 in the amount of $100,000 for the 1994-95 program year. The manual is intended as a reference document to help selected community-based organizations in motivating students toward math and science careers, with the help of linkages and collaborative arrangements with middle/junior high schools, institutions of higher education and other organizations. The manual covers a comprehensive array of academic and non-academic services that may be used to establish model, community-based programs essential in keeping Latino and other minority students involved in the educational process. A copy of the manual is included in Appendix C.

b. ASPIRA Study Habits Inventory. The inventory was developed to assist students, teachers, administrators and parents in assessing study habits at the middle/junior and high school levels. This publication was produced for the ASPIRA National Health Careers Program which is 97% funded by the Health Careers Opportunity Program of the U.S. Public Health Service under grant #1D18MB02170-01 and 3% funded by Bristol-Myers Squibb for a total of $289,578 for the 1993-94 program year.

c. Communities Count: Community Based Sourcebook for promoting Mathematics & Science Education. This sourcebook was developed for organizations that would like to spark the imagination of young Latinos and other minority youth and encourage them to pursue excellence in mathematics and science. This publication was produced under grant #B5636 in the amount of $100,000 for the 1990-91 program year from the Carnegie Corporation of New York.

ASPIRA Association, Inc.
National Office
1112 16th Street, N.W., Ste. 340
Washington, D.C. 20036
(202) 835-3600

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ASPIRA Association, Inc.
National Office
1112 16th Street, N.W., Suite 340
Washington, D.C. 20036
(202) 835-3600